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EVALUATION OF THE HEALTHWAYS MODEL 1971 CAPILLARY-TUBE DEPTH GA--ETC(U)

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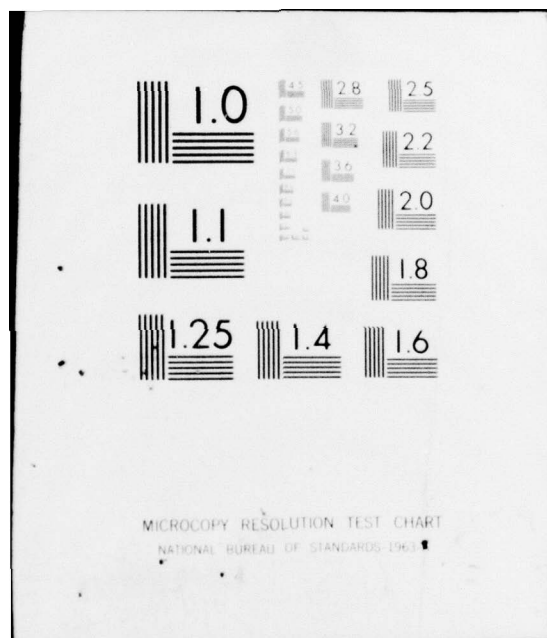
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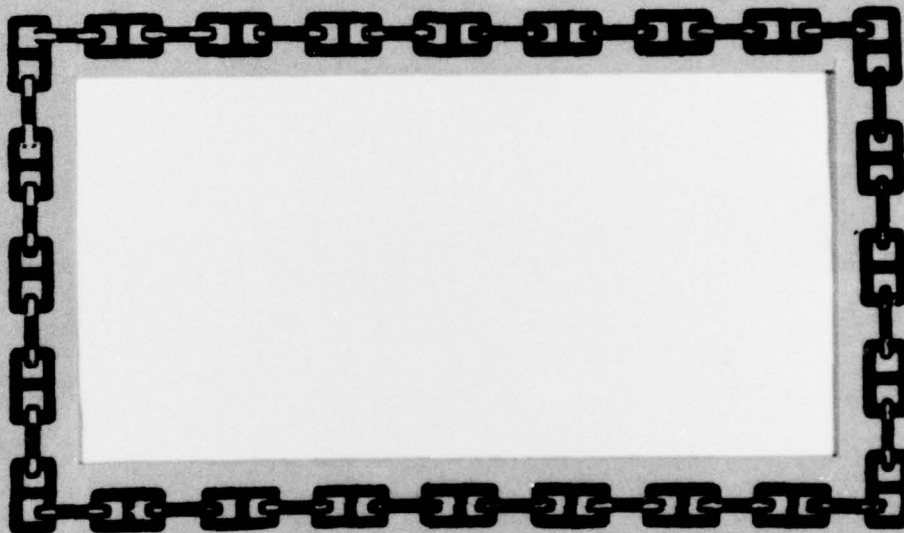
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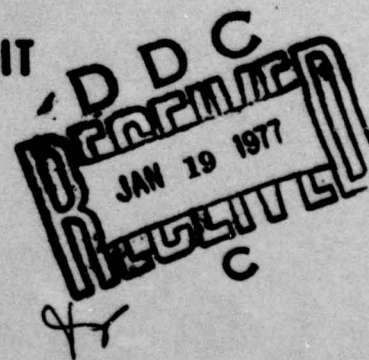
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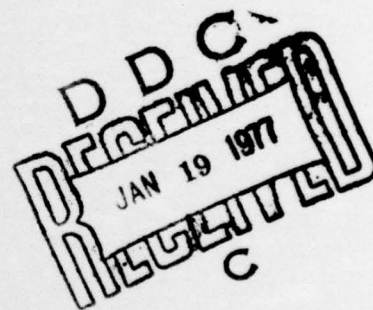
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DEPARTMENT OF THE NAVY  
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NAVY EXPERIMENTAL DIVING UNIT  
REPORT 10-76  
EVALUATION OF THE HEALTHWAYS MODEL 1971  
CAPILLARY-TUBE DEPTH GAUGE

D. J. SCHMITT

March 1976



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# ABSTRACT

The Healthways Diving Company submitted two model 1971 capillary-tube depth gauges to the Navy Experimental Diving Unit for test and evaluation.

Although the tests proved the gauge to be accurate, they also disclosed a problem with the dial face. Inasmuch as the dial is secured with only one screw, there is a real danger of the dial turning if the screw loosens or if the rubber mounting case is compressed.

The Healthways Model 1971 capillary-tube depth gauge is not recommended for Navy approval.



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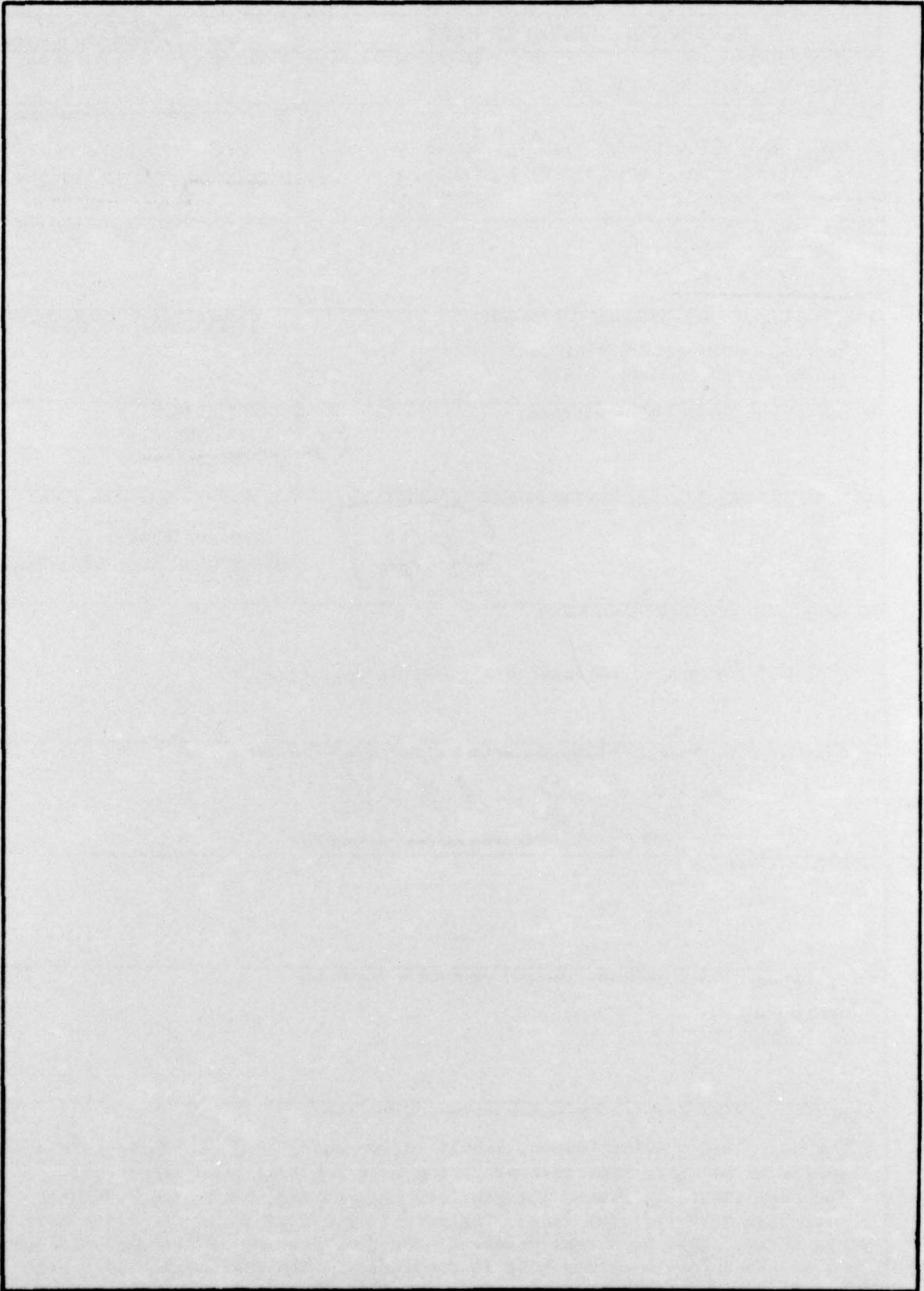
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## INTRODUCTION

The Healthways Diving Company submitted two model 1971 capillary-tube SCUBA depth gauges for test and evaluation by the Navy Experimental Diving Unit in March 1976.

The capillary-tube depth gauge operation, based on Boyle's Law (a gas at constant temperature varies inversely with pressure), uses a water column. Its depth range is 0 to 250 feet of sea water (fsw).

## TEST EQUIPMENT

A Bethlehem chamber, model 18.3610HP, serial No. 76.1018, and test gauge 25546-25011-GAG were required to test the capillary-tube depth gauges. The test gauge calibration is given in Figure 1. Calibration date was 1 March 1976.

## TEST PROCEDURE

The depth gauges were placed in a pan and then covered with fresh water. The pan was placed in the Bethlehem chamber, which was then pressurized with high-pressure air to the depths shown in Table 1. The gauges were tested to 250 fsw. Gauge readings were achieved by looking through the chamber window.

## RESULTS

Results of the tests of the two capillary-tube depth gauges are given in Table 1.

## MAN-HOURS REQUIRED FOR TEST

Man-hours required for test were as follows:

	<u>Man-hours</u>
Chamber operation, 3 men, 2 hours	6
Reporting manuscript, 1 man, 3 hours	3
Duplicating, 1 man, 1 hour	<u>1</u>
TOTAL	10 Man-hours

## CONCLUSIONS AND RECOMMENDATIONS

Readings on the Healthways capillary-tube depth gauges were very accurate. However, each dial face, although easy to read, is secured by only one screw in its center. If this screw should loosen or if the rubber mounting case were compressed, the dial would turn, and the gauge would be useless. (If the dial were secured in two locations instead of just one, the dial face could be kept from turning.) The Healthways capillary-tube depth gauge in its present configuration, therefore, cannot be recommended for Navy approval.

TEST GAUGE

PART NUMBER 25546-25011 GAG

SERIAL NUMBER 10,52-1

PRESSURE RANGE 200 P.S.I. ACCURACY + 1/4 % FULL SCALE (+ -1.1 P.S.I.)

CALIBRATION

INCREASING PRESSURE		
Applied Press.	Indicated Press.	Difference
0	0.00	0.00
30	30.26	+.26
60	59.63	-.37
90	89.66	-.34
120	119.7	-.3
150	149.5	-.5
180	178.89	-1.11
200	198.9	-1.1

FIGURE 1. CALIBRATION OF TEST GAUGE



TABLE 1  
TEST RESULTS OF HEALTHWAYS CAPILLARY-  
TUBE DEPTH GAUGES, MODEL 1971

Test Depth (ft)	Test 1		Test 2	
	Gauge 1	Gauge 2	Gauge 1	Gauge 2
0	0	0	0	0
20	20	19	20	20
50	50	48	50	50
70	70	68	70	70
80	80	75	80	80
100	100	96	100	100
150	150	140	150	150
200	200	190	200	200
250	250	250	250	250
150	150	150	150	150
100	100	100	100	100
50	48	50	50	50
0	0	0	0	0



